NSF Standards-Based Science Curricula:

Teaching and Learning Science

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- The *National Science Education Standards* are premised on a conviction that all students deserve and must have the opportunity to become scientifically literate. The *Standards* look toward a future in which all Americans, familiar with basic scientific ideas and processes, can have fuller and more productive lives.

- http://nap.edu/readingroom/books/nses/

- The National Research Council (2005) defined four essential features of effective instructional units for science:
  - *(1) designed with clear learning outcomes in mind;*
  - *(2) thoughtfully sequenced into the flow of classroom science instruction;*
  - *(3) designed to integrate learning of science content with learning about the processes of science; and*
  - *(4) incorporate ongoing student reflection and discussion.*

Science Inquiry

- Inquiry is the process scientists use to build an understanding of the natural world based on evidence. Students can learn about the world using inquiry. Although learners rarely discover knowledge that is new to humankind, current research indicates that when engaged in inquiry learners build knowledge new to themselves.

Science Inquiry

- Learner inquiry is a multifaceted activity that involves making observations; posing questions; examining multiple sources of information to see what is already known; planning investigations; reviewing what is already known in light of the learner's experimental evidence; using tools to gather, analyze and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations.

Science Inquiry

- As a result of participating in inquiries, learners will increase their understanding of the science subject matter investigated, gain an understanding of how scientists study the natural world, develop the ability to conduct investigations, and develop the habits of mind associated with science.

- (*Council of State Science Supervisors, 2001*)

Science Curricula

- EBS (Event Based Science) http://www.ebsinstitute.com/
- FOSS (Full Option Science System) http://www.lawrencehallofscience.org/foss/
- IMaST (Integrated Mathematics, Science, & Technology) http://www.cemast.ilstu.edu/programs/imast/index.shtml
- SEPUP (Science Ed. for Public Understanding Program) http://www.lawrencehallofscience.org/sepup/
- STC (Science & Technology for Children) http://www.carolina.com/carolina_curriculum/stc/
- GEMS (Great Explorations in Math and Science) http://www.carolina.com/carolina_curriculum/gems/

Science Curricula

- GLOBE Program
  http://www.globe.gov/globe_flash.html
- CPO (Physics First)
  http://www.cpo.com/tp_pfc_entry.shtml
- ChemCom (Chemistry in the Community)
  http://www.whfreeman.com/Chemcom/
- BSCS Science Programs
  http://www.bscs.org/curriculumdevelopment/
- Active Physics – Active Chemistry
  http://www.its-about-time.com/htmls/ac/ac.html

FOSS

- **1. NSF Kit-based Approach (Full Kit Option)**
- FOSS and Delta Science Modules in grades K-5
- FOSS and Lab-Aids Kits in grades 6-8
- **2. Textbook Approach (Full Text Option)**
- Textbook with materials program grades K-8
- **3. Blended Approach (Blend Option)**
- A combination of the grade-appropriate kits and textbook modules, plus the Accelerated eighth grade program

Resource

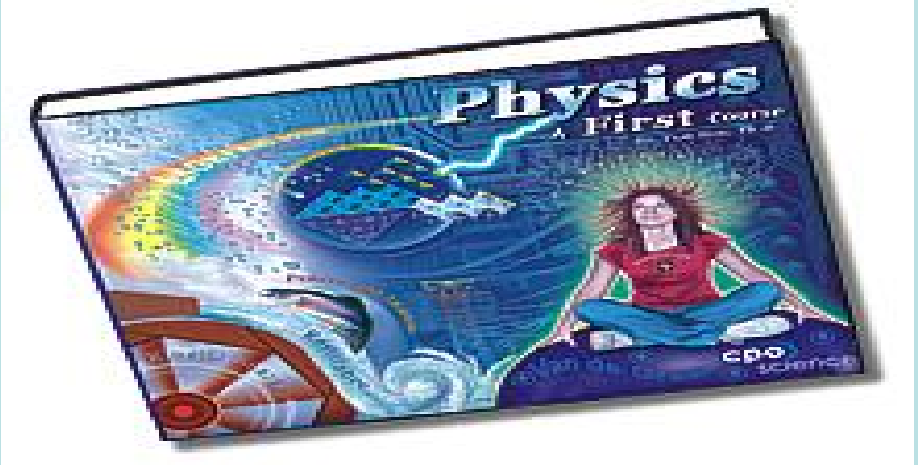
- EDC K-12 Science Curriculum Dissemination Center
- SELECTED STANDARDS-BASED CURRICULUM PROFILES Funded by the National Science Foundation A resource of the EDC K-12 Science Curriculum Dissemination Center Education Development Center

GEMS

- Great Explorations in Mathematics and Science
- **GEMS** activities engage students in direct experience and experimentation to introduce essential, standards-based principles and concepts.
- Kit Based Intruction

CPO Physics A First Course

- Physics A First Course is created around the premise that science is a process of exploration and discovery of ideas and that this new knowledge connects and enhances lives.



Resources

- National Science Teachers Association
- **National Science Education Leadership Association**
- National Science Foundation
- **International Study Center**
- **National Assessment of Educational Progress (NAEP)**
- **Project 2061**